VELICHENKO, V.V.

Physics

So: JPRS 55366
07 Mar 72

UDC 519.95

QUESTIONS ON THE INVARIANCE OF DISCRETE SYSTEMS

AIC Physics?

[Article by V. V. Velichenko, Moscow Institute of Physics and Technology; Moscow, Doklady Akademii Nauk SSSR, Russian, Vol 201, No 2, 1971, signed to press 5 July 1971, pp 284-287]

The problem of the weak invariance of discrete systems was considered in [1]. In the present work, the general problem of the invariance of nonlinear discrete systems is studied. The analogy between the conditions of invariance and the characteristics of discrete and continuous [2-4] invariant systems is explained.

1°. Statement of the problem: Let the n-dimensional system of discrete equations

$$x^{i+1} = f^{i+1}(x^i, u^i) \quad (i = 0, \ldots, N-1) \qquad (1)$$

and the sequence of functions

$$\Phi = \{\Phi^0(x^0), \Phi^1(x^1), \ldots, \Phi^N(x^N)\}, \qquad (2)$$

be given.

Let us call the system (1) $\Phi(x)$ - invariant with respect to u in the given domain $A = \{A^0, A^1, \ldots, A^N\}$ $(A^i \subset X^i = E_n)$ (or strongly invariant), if the sequence of values (2) in its trajectories do not depend on the disturbance u = $(u^0, \ldots, u^{N-1})$. We will investigate the conditions of the $\Phi(x)$- invariance system (1).

The function f^i in the domains of their definitions $G^i = X^i \times U^i$ and Φ^i in A^i is assumed to be continuous in the whole of their variables and continuously differentiable with respect to x^i. We will consider the disturbance u permissible for which $x^i \in A^i$ and $(x^i, u^i) \in G^i$.

1/2 027 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--THE THEORY OF DISCRETE TRANSMISSION OF CONTINUOUS INFORMATION -U-

AUTHOR--VELICHKIN, A.I.

COUNTRY OF INFO--USSR

SOURCE--THE THEORY OF DISCRETE TRANSMISSION OF CONTINUOUS INFORMATION (TEORIYA DISKRETNOY PEREDACHI NEPRERYVNYKH SOOBSHCHENIY) MOSCOW.

DATE PUBLISHED--------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., NAVIGATION

TOPIC TAGS--DISCRETE AUTOMATION, COMMUNICATION SYSTEM, PULSE MODULATION, TV BROADCASTING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1991/0564 STEP NO--UR/0000/70/000/000/0001/0296

CIRC ACCESSION NO--AM0110364

UNCLASSIFIED

2/2 027 UNCLASSIFIED PROCESSING DATE--02OCT70
CIRC ACCESSION NO--AM0110364

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: PREFACE 3. CONVENTIONAL SYMBOLS 5. INTRODUCTION 6. CHAPTER I FORMULATION OF THE PROBLEM OF SYNTHESIS OF MIXED COMMUNICATION SYSTEMS 13. II TRANSMISSION OF CONTINUOUS RANDOM MAGNITUDES ALONG THE DISCRETE CHANNEL OF COMMUNICATION WITHOUT INTERFERENCES 43. III CHARACTERISTICS OF DISCRETE CHANNELS OF MIXED COMMUNICATION SYSTEMS 67. IV INTERFERENCEFREE CODE PULSE MODULATION IN TRANSMITTING A CONTINUOUS MAGNITUDE 92. V QUANTIZATION OF CONTINUOUS PROCESSES IN THE SYSTEM WITH CODE PULSE MODULATION 107. VI SYNTHESIS OF EVALUATING FILTERS FOR COMMUNICATION SYSTEMS WITH CODE PULSE MODULATION 137. VII SYSTEMS WITH DELTA MODULATION WITHOUT INTERFERENCE IN THE COMMUNICATION CHANNEL 173. VIII INTERFERENCE FREE COMMUNICATION SYSTEMS WITH DELTA MODULATION 196. IX COMMUNICATION SYSTEMS WITH FORECASTING 228. X DISCRETE SPEECH TRANSMISSION 242. XI DISCRETE TRANSMISSION OF TELEVISION COMMUNICATION 277. LITERATURE 289. SUBJECT INDEX 293.
EXAMINED ARE COMMUNICATION SYSTEMS IN WHICH CONTINUOUS INFORMATION IS GIVEN BY MEANS OF DISCRETE SIGNALS RECEIVING A FINITE NUMBER OF VALUES. SUCH SYSTEMS ARE CALLED MIXED. A SYNTHESIS OF COMMUNICATION SYSTEMS IS MADE, OPTIMUM FOR THE CRITERION OF A MINIMUM OF AN AVERAGE SQUARE OF TRANSMISSION ERROR FOR DISCRETE CHANNELS WITH ASSIGNED STATISTICAL CHARACTERISTICS. GIVEN IS A METHOD FOR THE CALCULATION OF THE OPTIMUM VALUES OF THE BASIC PARAMETERS OF COMMUNICATION SYSTEMS AND ANALYZED THEIR CHARACTERISTICS.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--02OCT70
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AUTHOR--VELICHKIN, A.I.

COUNTRY OF INFO--USSR

SOURCE--THE THEORY OF DISCRETE TRANSMISSION OF CONTINUOUS INFORMATION
(TEORIYA DISKRETNOY PEREDACHI NEPRERYVNYKH SOOBSHCHENIY) MOSCOW.
DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., NAVIGATION

TOPIC TAGS--DISCRETE AUTOMATION, COMMUNICATION SYSTEM, PULSE MODULATION,
TV BROADCASTING

CONTROL MARKING--NO RESTRICTIONS

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2/2 027 UNCLASSIFIED PROCESSING DATE--02OCT70
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: PREFACE 3. CONVENTIONAL SYMBOLS 5. INTRODUCTION 8. CHAPTER I FORMULATION OF THE PROBLEM OF SYNTHESIS OF MIXED COMMUNICATION SYSTEMS 13. II TRANSMISSION OF CONTINUOUS RANDOM MAGNITUDES ALONG THE DISCRETE CHANNEL OF COMMUNICATION WITHOUT INTERFERENCES 43. III CHARACTERISTICS OF DISCRETE CHANNELS OF MIXED COMMUNICATION SYSTEMS 67. IV INTERFERENCEFREE CODE PULSE MODULATION IN TRANSMITTING A CONTINUOUS MAGNITUDE 92. V QUANTIZATION OF CONTINUOUS PROCESSES IN THE SYSTEM WITH CODE PULSE MODULATION 107. VI SYNTHESIS OF EVALUATING FILTERS FOR COMMUNICATION SYSTEMS WITH CODE PULSE MODULATION 137. VII SYSTEMS WITH DELTA MODULATION WITHOUT INTERFERENCE IN THE COMMUNICATION CHANNEL 173. VIII INTERFERENCE FREE COMMUNICATION SYSTEMS WITH DELTA MODULATION 196. IX COMMUNICATION SYSTEMS WITH FORECASTING 228. X DISCRETE SPEECH TRANSMISSION 242. XI DISCRETE TRANSMISSION OF TELEVISION COMMUNICATION 277. LITERATURE 289. SUBJECT INDEX 293.

EXAMINED ARE COMMUNICATION SYSTEMS IN WHICH CONTINUOUS INFORMATION IS GIVEN BY MEANS OF DISCRETE SIGNALS RECEIVING A FINITE NUMBER OF VALUES. SUCH SYSTEMS ARE CALLED MIXED. A SYNTHESIS OF COMMUNICATION SYSTEMS IS MADE, OPTIMUM FOR THE CRITERION OF A MINIMUM OF AN AVERAGE SQUARE OF TRANSMISSION ERROR FOR DISCRETE CHANNELS WITH ASSIGNED STATISTICAL CHARACTERISTICS. GIVEN IS A METHOD FOR THE CALCULATION OF THE OPTIMUM VALUES OF THE BASIC PARAMETERS OF COMMUNICATION SYSTEMS AND ANALYZED THEIR CHARACTERISTICS.

UNCLASSIFIED

VELICHKINA, S. V.

COLEEN

29 Oct 71 105 FPD:CYBERNETICS

93. USSR UDC 612.821.6 : 612.826.2+612.825.2

SHVYRKOV, V. B. and VELICHKINA, S. V.

SO. FOREIGN PRESS DIGEST
29 OCT 1971

"A Study of the Processes of Reproduction of a Model of Unconditioned Reinforcement Given a Conditioned Signal"

Kiberneticheskiye Aspekty v Izuchenii Raboty Mozga (Cybernetic Aspects of the Study of the Brain's Functioning), Moscow, Nauka Publishing House, 1970, pp 109-118

Abstract: Statistical processing on a digital computer of the electrical activity of a rabbit during the development of a conditioned defense reflex showed that the rhythm of the conditioned light stimulus is not transferred to the cortical reinforcement point. The configuration of the induced potential which arises at this point when a conditioned signal is given approaches the response to the reinforcing shock of the current.

The data obtained are examined as contradicting notions on the "beaten path" for a conditioned excitation to the cortical reinforcement point. They support the assumption that an afferent model of the reinforcing stimulus is reproduced at this point when a conditioned signal is given.

USSR

UDC 621.791.72:535.14

VELICHKO, A. A., GARASHCHUK, V. P., and MORAVSKIY, V. E.

"Characteristics of Impulse Laser Welding Joints With Root Openings"

Kiev, Avtomaticheskaya svarka, No 4, Apr 72, pp 75-76

Abstract: A feasibility study was conducted at the Electric Welding Institute imeni Ye. O. Paton on impulse laser welding of lap joints with root openings. The latter's dimensions were varied by special spacer linings of specific thickness with slits. The complete conformity of the openings to the spacers was verified by metallographic examination. Experimental tests indicate that the dependence of the weld point's tensile strength on the opening decreases with the shape factor of penetration. The dependence of the lap weld strength on the root opening dimensions is also governed by the properties of both the crystallized weld pool and the base metal. Hence, the tensile strength and plasticity of the cast nugget metal that had formed in the root opening govern the weld point strength while both the fluidity and the surface tension factor of the melt largely determine the capacity of the metals (being welded) to form here a fairly large fusion zone. (2 illustrations, 1 bibliographic reference)

1/1

USSR

UDC 612.38:547.72]-06:[612.273.2+612.275.1

VELICHKO, A. G., Chair of Propedeutics of Internal Diseases, First Leningrad Medical Institute imeni I. P. Pavlov and Leningrad Scientific Research Institute of Radiation Hygiene

"Effect of Hypoxia on Iron Absorption"

Moscow, Meditsinskaya Radiologiya, No 1, 1970, pp 49-52

Abstract: Iron absorption in a group of mountain climbers increased from 25.3 percent in Leningrad to 37.8 percent after they remained for 3 days on a peak in the Central Caucasus (Elbrus, 5,633 above sea level). A month after returning to sea level, iron absorption dropped to 12.2 percent. The increase in iron absorption after the climb was due to the stimulation of erythropoiesis. The serum iron level at this time tended to decrease, a sign of iron utilization. Since the hemoglobin concentration rose at the same time, it would appear that the increased utilization of iron was caused by its incorporation into hemoglobin.

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Acc. Nr: AP0034765

Ref. Code: UR 0241

PRIMARY SOURCE: Meditsinskaya Radiologiya, 1970, Vol 15, Nr 1, pp 49-52

THE INFLUENCE OF HYPOXIA ON THE ABSORPTION OF IRON

A. G. Velichko

Summary

The absorption of iron in mountaineers prior to mounting (in Leningrad) comprised 25.3 per cent. During mountain mounting (height of 4200—5033 m) the iron absorption rises by 1½ times amounting to 37.8 per cent. After descent to the sea level the iron absorption decreased by 2 times comprising 12.2 per cent.

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So: JPRS 59610
25 JULY 1973

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②

VELICHKO, A. P.

INITIAL STRESSES IN REINFORCED AND FILLED POLYMERS

UDC 678.5:539.319

[Article by V. P. Stavrov, A. P. Velichko, Gomel' State University, Ural Polytechnic Institute imeni S. M. Kirov, Sverdlovsk; Riga, Mekhanika Polimerov, Russian, No 1, 1973, submitted 19 January 1972, pp 90-96]

The methods of the statistical elasticity theory were used to calculate the mean stresses in the components of uniaxially reinforced and randomly filled polymers occurring during the process of manufacturing the material as a result of different coefficients of linear expansion of the components and chemical shrinkage of the binder. Formulas were also obtained for the microscopic characteristics of the investigated media — the Young's moduli, the coefficients of linear expansion and the shrinkage factors. The results are compared with the experimental data and with the results of calculations by the formulas of other authors. The relations obtained for the stresses in the components as a function of their properties provide a satisfactory explanation for the experimentally established positive correlation between the shrinkage and the compressive strength of the composition based on furan resin. The bibliography has 9 entries.

The problem of determining the initial (temperature and shrinkage) stresses in polymer materials has been stated by various authors [1-5]. In reference [3], the advantages of the statistical statement of the problem of the initial stresses in reinforced polymers are indicated. In the present paper, the calculation formulas were obtained for the mean stresses in the components of the polymer materials reinforced in one direction and in polymer compositions based on the disperse or short-fiber fillers. The cause of the occurrence of the initial stresses can be the variation in volume of the binder as a result of polymerization or polycondensation (chemical shrinkage), and the difference in the coefficients of linear expansion of the components: therefore, in the given paper both mentioned factors are considered. The problem is solved under the assumption of the linear elasticity of the components which, of course, leads to higher values of the stresses by comparison with the stresses actually arising in the materials; however, the known experimental papers [1, 4] in which a relation close to linear was obtained for the stresses in the reinforced

Instrumentation and Equipment

USSR

UDC 669.71.472

SMORODINOV, A. N., VELICHKO, B. P., NOSIKOV, V. I., KIL', I. G.

"Bottom of an Aluminum Electrolyzer"

USSR Author's Certificate No 281825, filed 18 Jul 69, published 3 Dec 70 (from RZh-Metallurgiya, No 7, Jul 1971, Abstract No 7G211P)

Translation: The bottom comprises cathode units with conducting steel rods embedded in them. In order to reduce the consumption of materials for the manufacture of the cathode units and the electrical resistances in the bottom, the cathode units in the upper section have grooves with inclined walls and up to 0.25 of the total height of the unit deep along their entire length. There is 1 illustration.

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USSR

UDC 669.71.472(088.8)

VELICHKO, B. P., and NOSIKOV, V. I., All-Union Scientific Research and Design Institute of Aluminum, Magnesium, and Electrode Industry

"Device for Tightening and Freeing of Contact Terminals of Anode Pins of Aluminum Electrolytic Reduction Cells"

USSR Author's Certificate No 262395, filed 16 Jan 69, published 21 May 70 (from RZh-Metallurgiya, No 11, Nov 70, Abstract No 11 G113 P)

Translation: A device is proposed for tightening and freeing of contact terminals of anode pins of aluminum electrolytic reduction cells, which includes a mechanical key and rotating and lifting drives. To simplify the design and the possibility of servicing external and internal rows of anode pins, the device is made in the form of a frame connected to the shaft of a bridge crane to which are attached two analogous mechanisms, consisting of a hollow tube with a key, located in the tube of a guiding shaft, engaged with it, and of drives for rotating and vertical travel of the tube. The coupling of the tube with the guiding shaft is done by a key slot joint of by a quadratic joint.

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USSR UDC 669.71.472(088.8)

NOSIKOV, V. I., VELICHKO, B. P., and GERASIMCHUK D. I.

"Cathode Aluminum Electrolyzer Device"

USSR Author's Certificate No 270254, Filed 19/08/68, Published 20/08/70 (Translated from Referativnyy Zhurnal-Metallurgiya, No 2, 1971, Abstract No 2 G151 P)

Translation: To reduce electric power losses in the contact between metal and bottom mass and to increase the service life of the cathode device, the cathode rods are made as assembled packets of bars, with the space between bars corresponding to the bar placement space in the working zone of a cathode device, while the ends of the bars where the packets extend out of the shell are connected into a common contact set.

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USSR

UDC 621.382.21

VELICHKO, B. V., STRUKOV, I. A., ETKIN, V. S.

"A Procedure for Measuring the Parameters of Semiconductor Diodes Under Dynamic Conditions"

Moscow, Poluprovodnikovyye Pribory i ikh Primeneniye, No 24, Izd-vo "Sovetskoye Radio", 1970, pp 226-235

Abstract: It is shown that accounting for the modulation of conductance enables determination of the pump modulation factor of the PN junction of mixer diodes under operating conditions. A measurement installation and procedure are described for finding the dynamic parameters of varactor and mixer diodes. The method is illustrated by experimental results of measurement of the capacitance modulation factor of varactor diodes and the pump modulation factor of mixer diodes under various loads from pump harmonics and combination frequencies. It is shown that accounting for the conductance branch of the admittance vector enables measurement of dynamic parameters of both varactor and mixer semiconductor diodes under various operating conditions. Seven figures, bibliography of seven titles.

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USSR

UDC 621.382.2

BABENKO, S.P., VELICHKO, B.V., DRYDO, I.M., MIKHAYLOVA, E.A., STRUKOV, I.A., ETKIN, V.S.

"Experimental Investigation Of The Frequency Dependence Of The Impedance Of A P-N Junction In A Wide Range Of Frequencies"

V sb. Poluprovodn. pribory i ikh primeneniye (Semiconductor Devices And Their Application--Collection Of Works), No 23, Moscow, "Sov.radio," 1970, pp 297-304 (from RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstruct No 12897)

Translation: An investigation is conducted of the frequency dependence of the impedance of a p-n junction in the 10--3600 MHz frequency range. The behavior is observed of such parameters of the p-n junction as total capacitance, conductance, and the Q-factor of the excess capacitance. A comparison is given of the experimental dependences with the frequency dependence of the computed diffusion conductivity of a p-n junction with a retarding field in the base. Conclusions are made with reference to the nature of the impedance of a p-n junction. 3 ill. 1 tab. 3 ref. Author's Abstract.

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1/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--EFFECT OF SEVIN ON LIVER FUNCTION AND STRUCTURE -U-
AUTHOR-(05)-KAGAN, YU.S., RODIONOV, G.A., VORONINA, L.YA., VELICHKO, L.S.,
KULAGIN, O.M.
COUNTRY OF INFO--USSR

SOURCE--FARMAKOL. TOKSIKOL. (MOSCOW) 1970, 33(2), 219-24
DATE PUBLISHED---------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--PESTICIDE, LIVER, RABBIT, CHOLINESTERASE, ENZYME ACTIVITY

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0162 STEP NO--UR/0390/70/033/002/0219/0224
CIRC ACCESSION NO--AP0123933
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2/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0123933

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PROLONGED ADMINISTRATION OF SEVIN TO RABBITS AND RATS CHANGED LIVER FUNCTION AND REDUCED THE CHOLINESTERASE ACTIVITY IN THE BLOOD AND INTERNAL ORGANS. SEVIN INTRODUCED THEOUGH A STOMACH PROBE AT 38 MG-KG DAILY FOR 1 MONTH INCREASED SERUM ALANINE AMINOTRANSFERASE AND ALK. PHOSPHATASE ACTIVITIES AND INCREASED THE RATIO OF LIVER WT. TO BRAIN WT. AT 7.6 MG-KG (ADDED TO THE FOOD) DAILY FOR 3 DAYS SEVIN INCREASED THE DURATION OF HEXOBARBITAL SLEEP AND SOMEWHAT INCREASED THE WT. RATIO OF LIVER TO BRAIN. SEVIN ADMINISTERED TO RABBITS AT 0.76 MG-KG AND TO RATS AT 0.38 MG-KG DAILY INHIBITED LIVER FUNCTION. REDUCED CHOLINESTERASE ACTIVITY AND CHANGES IN SERUM PROTEIN FRACTIONS WERE OBSD. WITH ALL DOSES. THE PESTICIDE INDUCED NECROTIC CHANGES IN THE LIVER. HITOCHEM. STUDIES SHOWED SHIFTS IN THE CONTENT AND DISTRIBUTION OF GLYCOGEN, IN LIVER SUCCINATE DEHYDROGENASE, AND IN CHOLINESTERASE OF THE BRAIN, SPINAL COLUMN, AND MOTOR NERVE ENDINGS OF THE STRIATED MUSCLES. SEVIN DID NOT ACCUMULATE IN THE BODIES OF RATS AND RABBITS. FACILITY: VSES. NAUCH. ISSLED. INST. GIG. TOKSIKOL. PESTITS., POLIM. PLAST. MASS, KIEV, USSR.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--MECHANISM OF COLORING GELATIN LAYERS. VII. DIFFUSION OF DYES INTO GELATIN LAYERS OF MATRIX RELIEFS -U-

AUTHOR-(02)-VELICHKO, G.V., SPASOKUKOTSKIY, N.S.

COUNTRY OF INFO--USSR

SOURCE--ZH. NAUCH. PRIKL. FOTOGR. KINEMATOGR. 1970, 15(2), 135-42

DATE PUBLISHED--------70

SUBJECT AREAS--METHODS AND EQUIPMENT

TOPIC TAGS--COLOR, DYE, GEL, DIFFUSION COEFFICIENT, ADSORPTION, PHOTOGRAPHIC EMULSION/(U)SF10 SPECTROPHOTOMETER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1957 STEP NO--UR/0077/70/015/002/0135/0142

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UNCLASSIFIED

2/2 019

CIRC ACCESSION NO--AP0112925 UNCLASSIFIED PROCESSING DATE--02OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DIFFUSION OF DYES INTO STRONGLY TANNED LAYERS OF MATRIX RELIEFS WAS STUDIED WITH ACIDIC RED 2 ZH. THE WT. OF THE TANNED GELATIN ON THE AREA OF THE FRAME OF 3.36 CM PRIME2 WAS 7.86 TIMES 10 PRIME NEGATIVE4 G. MEASUREMENTS WERE MADE ON AN SF-10 SPECTROPHOTOMETER. THE DIFFUSION COEFF. INCREASED WITH THE CONCN. OF THE DYE, BUT ABOVE A CONCN. OF 0.175PERCENT THE INCREASE WAS LOW. INCREASE IN PH RAISED THE DIFFUSION COEFF., ESP. BETWEEN PH 4.27 AND 5.0. ANALOGOUS EFFECTS WERE OBSD. IN GELATIN GEL. ADDN. OF ELECTROLYTES TO THE SOLN. STRONGLY REDUCED THE DIFFUSION COEFF. THE DIFFUSION COEFF. INCREASED WITH RISING TEMP. BUT THE TEMP. EFFECT WAS LESS PRONOUNCED THAN THE EFFECT OF THE OTHER PARAMETERS. THE EFFECT OF THE TEMP. ON THE DYEING RATE CAN BE EXPRESSED BY DETG. THE ACTIVATION ENERGY OF THE PROCESS. THE CALCD. APPARENT DIFFUSION COEFF. OF 10 PRIME NEGATIVE9-10 PRIME NEGATIVE10 CM PRIME2-SEC IS CONSIDERABLY LOWER THAN THE LITERATURE DATA (10 PRIME NEGATIVE6-10 PRIME NEGATIVE7) WHICH IS DUE TO THE MORE COMPACT STRUCTURE OF THE STRONGLY TANNED GELATIN.

UNCLASSIFIED

USSR

UDC 621.791.72:535.14

VELICHKO, O. A., GARASHCHUK, V. P., and V. E. MORAVSKIY

"Laser Butt Welding of Dissimilar Metals"

Kiev, Avtomaticheskaya svarka, No 3, Mar 72, pp 71-73

Abstract: The Electric Welding Institute imeni Ye. O. Paton conducted studies on the application of solid-state lasers for welding most commonly used metals. The specimens were butt-welded under pulsed conditions with weld spot overlaps. The overlapping factor ranged from 50 to 75%, depending on the physical properties of the metals. Optimum conditions were selected to ensure maximum strength, appearance, and quality of the welds. Metallographic examinations of welds on similar and dissimilar refractory metals indicate extensive structural inhomogeneity and uneven microhardness as well as longitudinal cracks along the grain boundaries. There were occasional specimen failures (under residual stress) attributed to greater concentrations of interstitial impurities at the grain boundaries. The technique of moving the heat spot from the welding line towards one of the metals being welded provides optimum weld geometry. Data on the mechanical properties of laser-welded dissimilar metals are cited. (2 illustrations, 1 table)

1/1

USSR

UDC 621.791.72:535.14

VELICHKO, O. A., GARASHCHUK, V. P., MORAVSKIY, V. E., Ye. O. Paton Electric Welding Institute

"Use of Pulsed Laser Welding for Mounting of Integral Solid Circuits Onto Printed Plates"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 1972, pp 50-51

Abstract: This work describes a study seeking methods and optimal modes for welding of the leads of integral solid circuits to the current-carrying lines on printed circuit plates using pulsed laser radiation. The strength of the welded joints produced was studied as a function of output energy, pulse length and focal-length of the focusing lens. At low radiation energies (0.7-1 j), the leads do not melt and the contact is formed by soldering, with the layer of gold on the leads serving as solder. At moderate energies (1.2-1.6 j), the contact is formed by melting of the lead and printed circuit current-carrying material. Further increases in energy are counter-productive. Pulse length influences strength of the welded joint and other quality factors: welded joint quality stability increases with increasing pulse length up to 6 msec, the optimal length. The optimal focal length of the focusing lens was found to be 50 mm.

1/1

USSR

VELICHKO, V. M. UDC: 518.5:681.3.06

"Standard Program of 'Rapid Fourier Transformation' for the BESM-6 Computer"

V sb. Vychisl. sistemy (Computer Systems--collection of works), vyp. 45, Novosibirsk, "Nauka", 1971, pp 120-125 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V974)

Translation: A program is described for calculating the coefficients of expansion of a function in a Fourier series. The function is given in the form of a discrete set of readings of length $N = 2^n$, where $n > 4$ (the maximum value is limited by the computer memory). The coefficients of the Fourier series are determined according to the formula

$$A_r = \sum_{k=0}^{N-1} X_k \exp(-2\pi jrk/N), \quad r = 0, \ldots, N-1,$$

where N_k is the k-th reading of the function; $j = \sqrt{-1}$. Attention is called to the complex nature of the quantities A_r and the absence of a coefficient

USSR

VELICHKO, V. M., Vychisl. sistemy, Novosibirsk, "Nauka", 1971, pp 120-125

preceding the sum in the given definition. A_r and $\overline{A}_{N-r}$ are complex conjugate, and therefore it is sufficient to calculate the first $N/2+1$ coefficients. Since the coefficients A_0 and $A_{N/2}$ are real, $A_{N/2}$ is entered in the cell designated for the imaginary part of A_0. The program compiles a table of cosines and sines, permutes the readings in the core store in accordance with the computational scheme for storage economy and calculates the required coefficients. The initial data block and the compiled table of cosines and sines are retained in the core store. The time of operation of the program is proportional to $N \log_2 N$ and is characterized by the following figures: computation of the spectrum of a function of 512 readings with calculation of a trigonometric table takes about 77 ms; without calculation of the table-- about 62 ms. Instructions for using the program are given along with an illustrative example.

2/2

Acc. Nr.: AR0113848

USSR

Ref. Code: UR0000

UDC: 622.765.06:553.31

VOVK, N. Ye., VELICHKO, V. P., MYASOYEDOV, V. M., CHERNOKUR, N. G., ONOPRIYENKO, N. N.

"Experience in the Flotation of Oxidized Ferruginous Quartzites by a Central Mining and Concentration Combine with the Use Apolar Collectors"

Obogashcheniye Poleznykh Iskopayemykh. Respublikanskiy Meshvedomstvennyy Nauchno-Tekhnicheskiy Sbornik (Concentration of Useful Minerals. Republic Interdepartmental Scientific and Technical Collection of Works), No 5, 1969, pp 30-35 (from Referativnyy Zhurnal, Metallurgiya, No 1, 1970, Abstract No 1V108)

Translation: The results of industrial tests on the "flotation" of oxidized iron ores at a central mining and concentration combine are set forth. With the aim of searching out new reagents and the partial replacement of raw tall oil, at the central mining and concentration combine a derivation of

1/2

Reel/Frame
19931021

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Acc. Nr.: AR0113848

diesel fuel is used, which constitutes an apolar collector of petroleum origin, a product of diesel fuel with a viscosity of 10.4 centipoise, consists basically of substandard diesel fuel (64%) and diesel oil (32%), the remainder consists of other oils. Use of the diesel-fuel product made it possible to float larger mineral grains (+0.16 mm). Partial replacement of raw tall oil by an abundant, inexpensive product of diesel fuel; yields good technological indicators and a considerable saving in the national economy.

2/2

Reel/Frame
19931022

1/2 015 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--PHASE DIAGRAMS OF TERNARY LIQUID SYSTEMS CONTAINING TWO BINARY LIQUID PHASE SEPARATION REGIONS WITH UPPER CRITICAL SOLUTION

AUTHOR-(02)-ZHURAVLEV, YE.F., VELICHKO, V.T.

COUNTRY OF INFO--USSR

SOURCE--ZH. OBSHCH. KHIM. 1970, 40(3), 516-20

DATE PUBLISHED---------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHASE DIAGRAM, SOLUBILITY, ACETONE, DIOXANE, GLYCEROL, ISOTHERM, LOW TEMPERATURE EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

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UNCLASSIFIED

2/2 015

CIRC ACCESSION NO--AP0128559 UNCLASSIFIED PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PHASE DIAGRAM DATA ARE PRESENTED
FOR THE TITLE SYSTEM AND A DIAGRAM OF COMPN. VS. N IS GIVEN FOR THE
HOMOGENEOUS EQUIL. PHASES AT ISOCONCNS. OF GLYCEROL. THE 25DEGREES
ISOTHERM IN THE TERNARY SYSTEM REVEALED THAT THE SURFACE OF THE REGION
OF THE 2 PHASE LIQ. STATE HAS A SADDLE LIKE CHARACTER. CRYOSCOPY IN C
SUB6 H SUB6 WAS USED TO DET. THE MOL. WT. IN SOLN. OF DIOXANE, ME SUB2
CO, AND THEIR MIXTS. IN THIS BINARY SYSTEM FORMULA WEIGHTS AGREE WITH
STANDARD MOL. WTS. ONLY AT INFINITE DILN. OWING TO ASSOCN. AMONG THESE
MOLS. THE HOMOGENEOUS BOUNDARY SYSTEM OF DIOXANE ME SUB2 CO WAS
INSUFFICIENT FOR RESOLVING THE GEOMETRIC FORM OF THE PHASE DIAGRAM OF
THE TERNARY SYSTEM. FACILITY: VORONEZH. POLITEKH. INST.,
VORONEZH, USSR.

UNCLASSIFIED

USSR

ARONOVA, G. V., VELICHKOVSKIY, B. T., RAGOL'SKAYA, F. S.,
STARKOV, P. S.

UDC 615.616.24-003.656.6

"Problem of Inverse Development of Silicosis Experimentally"

Nauch. tr. Irkutsk. med. in-t (Scientific Works of the Irkutsk Medical Institute), 1972, vyp 110, pp 35-36 (from RZh--Farmakologiya, Khimioterapevticheskiye Sredstva, Toksikologiya, No 3, Mar 73, Abstract No 3.54.875)

Translation: The histologic and biochemical alterations in the lungs of animals subject to the effect of quartz (I) or silica sublimate (II) combined with polyvinoxide (III) were compared. Under the effect of I after three months, expressed silicotic alterations were detected in the lungs which built up subsequently. Under the effect of II, the silicotic alterations were more intense after 15 days than under the effect of I, but after three months, an active process of inverse development of fibrosis was detected which ended by the 17th month. For animals receiving II plus III, the dynamics of the inverse development of silicotic alterations were still more expressed. The dynamics of silicotic alterations in animals receiving I plus III were the same as for those receiving II plus III.

1/1

Welding

USSR

UDC 621.774.2.01:621.797.7

VELIGIN, S. A., ZHUKOVSKIY, B. D., Doctor of Technical Sciences, and
ZIL'BERSHTEYN, L. I., Candidate of Technical Sciences

"Determining Technically Possible One-Hour Productivity of Electric Pipe-Welding Stands"

Dnepropetrovsk, Metallurgicheskaya i Gornorudnaya Promyshlennost', No 5, Sep-Oct 70, pp 32-34

Abstract: A method for determining the one-hour productivity of electric pipe-welding stands with separate rolls, stands which stop at the time of separate roll junction, as well as continuous stands, is described. Expressions are derived from which the technically feasible one-hour productivity can be determined. The minimum admissible strip length compatible with continuous welding is given by a formula. The possible increase in productivity was determined for the case of continuous welding stands with continuous welding. Data on pipe external diameter, and on the length, width, and thickness of strip used at the Dnepropetrovsk Plant are given in tables. The relationship between the increase in productivity and the strip length in a roll is presented in a graph.

1/1

1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--INFLUENCE OF SODIUM SULFIDE ADDITIVES ON THE ELECTROCHEMICAL
BEHAVIOR OF FUSED TIN SULFIDE -U-

AUTHOR-(02)-VELIKANOV, A.A., BELOBORODOV, I.I.

COUNTRY OF INFO--USSR

SOURCE--UKR. KHIM. ZH. 1970, 36(4), 351-6

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MATERIALS, PHYSICS

TOPIC TAGS--SEMICONDUCTOR MATERIAL, ELECTRICAL PROPERTY, THERMAL EFFECT,
TIN SULFIDE, SODIUM SULFIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0367

CIRC ACCESSION NO--AP0137471 STEP NO--UR/0073/70/036/004/0351/0356

UNCLASSIFIED

2/2 020

CIRC ACCESSION NO--AP0137471 UNCLASSIFIED PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLES OF SP. COND. AND OF THE TEMP. COEFF. OF COND. ARE GIVEN FOR VARIOUS SNS-NA SUB2 S MIXTS. AT 750-1050DEGREES. AT ALL TEMPS., THE MIN. COND. WAS AT A COMPN. CLOSE TO 47.81 MOLE PERCENT NA SUB2 S. AT 680DEGREES, THE MAX. CURRENT YIELD OF SN WAS 32.3PERCENT OBTAINED WITH A C.D. OF 1.5 A-CM. NO SIGNS OF LIBERATION OF NA WERE OBSD. THE ADDN. OF NA SUB2 S UP TO A LIMIT DECREASES THE NONIONIC COND. OF THE SEMICONDUCTOR WITH INCREASE OF THE COND. OWING TO IONS AND INCREASE IN SN DEPOSITION. FACILITY: KIEV. GOS. UNIV. IM. SHEVCHENKO, KIEV, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--THERMO E.M.F. OF INDIUM TELLURIUM MELTS -U-

AUTHOR-(03)-SHEVCHUK, F.P., MALINOVSKY, V.V., VELIKANOV, A.A.

COUNTRY OF INFO--USSR

SOURCE--UKRAIN. KHIM. ZHUR., JAN. 1970, 36, (1), 58-60

DATE PUBLISHED----JAN70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--TELLURIUM ALLOY, METAL MELTING, INDIUM ALLOY, INTERMETALLIC COMPOUND, THERMOELECTROMOTIVE FORCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1999

CIRC ACCESSION NO--AP0118958

STEP NO--UR/0073/70/036/001/0058/0060

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118958

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMO,E.M.F. OF PURE TE AND IN,TE MELTS OF A WIDE RANGE OF COMPOSITIONS (DOWN TO 30 AT. PERCENT TE) WAS MEASURED AT 400-900DEGREES C. MELTS WITH LOW TE CONCENTRATIONS HAD A NEGATIVE THERMO,E.M.F. OF SMALL ABS. VALUE, ALMOST INDEPENDENT OF TEMP. FOR MELTS WITH THE STOICHIOMETRIC COMPOSITION IN SUB2 TE SUB3 THE THERMO,E.M.F. BECAME POSITIVE AND REMAINED SO AS THE TE CONTENT INCREASED FURTHER. THE ABS. THERMO,E.M.F. REACHED A MAX. AT 65 AT. PERCENT TE AND THEN FELL, REACHING A MIN. FOR PURE TE.

UNCLASSIFIED

USSR

BARDYSHEV, V. I.; VELIKANOV, A. M.; GERSHMAN, S. G.; KRYSHNIY, V. I. (Acoustics Institute of the USSR Academy of Sciences, Moscow)

"Underwater Noise Level of the Ocean as a Function of Wind Velocity"

Moscow, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

TRANSLATION: We measured underwater ocean noises at depths of 100 to 130 meters at a distance of 20 km from the shoreline. One hydrophone was attached to a submerged buoy at a depth of 60 meters and was practically unprotected from hydrodynamic noises by the action on it of underwater currents. The second hydrophone was secured at a height of 1.5 meters from the bottom and protected by a deflector which, as indicated by additional studies, substantially lowered the level of hydrodynamic noises at frequencies below 100 cps. Underwater noise levels of the ocean were measured in the third-octave, half-octave, and 4 cps frequency bands over an average time of several seconds and were reduced to a band width of 1 cps and expressed in decibels read from the

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BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

level $2\cdot10^{-5}\,\text{m}\mu^{-2}\cdot\text{cps}^{-1/2}$. The measurements were made on an average of twice a day over a period of six months. The wind velocity was measured regularly every 3 hours. The Pearson mean square correlation was used for the stochastic dependence of the underwater noise level p on the wind velocity v. At those frequencies for which such a correlation was discovered a further study of it was made: in particular, it was ascertained whether there is a correlation between the conditional mathematical expectations of the processes studied. For this purpose there was calculated a correlation ratio η, which is a measure of any type of correlation: linear as well as nonlinear [1]. Further, the degree of linearity of the dependence of p on v was established, for which purpose the correlation coefficient R was calculated and compared with the corresponding value of η: for $\eta = R$ the dependence is linear; for $\eta > R$, it is nonlinear. To establish the fiducial probability of the assertion $\eta > R$ the method of confidence intervals as well as the distribution F were used [2]. Lines of regression reflecting the type of correlation of p with v were selected by the method of least squares. The calculations were carried out on an electronic computer.

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BARDYSHEV, V. I., Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

cps	1,0	4,2	8.3	66,7	140	6600	9600
R	0,15	0,15	0.26	0.41	0,54	0.38	0,39
η	0,30	0,28	0,36	0,49	0,59	0,44	0,48

It was established that the correlation of p with v is the most pronounced at the frequencies 100-200 cps, somewhat weaker at frequencies higher than 200 cps, and the weakest at frequencies below 100 cps. For the given measurements by the first hydrophone the stochastic dependence of p on v practically disappears at frequencies below 10 cps (the fiducial probability of a correlation at a frequency of 10 cps does not exceed 50%; at a frequency of 5 cps, 10%). For the given measurements by the second hydrophone a relationship of p with v can be traced through the entire frequency interval of measurements -- down to a frequency of 1 cps -- so that a correlation appears. In the table the values of η and R are shown for several frequencies for the given measurements of the second hydrophone. For all frequencies the fiducial probability that $\eta > 0$ is not less than 99.9%. The fiducial probability of the assertion that $R > 0$ for a frequency of 2.1 cps is not less than 98%; for frequencies of 8.3 cps and higher, more than 99.9%. The fiducial probabil-

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USSR

BARDYSHEV, V. I., Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

ity that $\eta > R$ appeared to be about 98% for a frequency of 2.1 cps and 80% for frequencies of 8.3 cps and higher. Apparently the correlation of p with v can be considered to be nonlinear. This is confirmed also by the fact that the amplitudes of the distribution of the values of p and v are substantially different from Gaussian. A linear equation of regression can be used only as a first approximation.

The differences in correlation of p and v at low frequencies for the data of the first and second hydrophones are apparently due to the fact that at frequencies below 10 cps with noise recorded by the first hydrophone hydrodynamic pulsation of pressure prevailed, caused by the turbulence of an underwater current (following the terminology of Blokhintsev [3], this effect should be called "pseudo sound"). In the range of measurements made, underwater currents which do not depend on the wind (ebb-flow and constant) predominated. The hydrodynamic noises indicated by the second hydrophone were substantially decreased by the deflection, and noises connected with the wind were more pro-

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BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

nounced. Actually, at frequencies of less than 100 cps the spectral noise levels, according to the data of the second hydrophone, are lower in comparison with those measured by the first hydrophone, and at frequencies of 6 cps and lower the difference is 20-26 decibels. At frequencies lower than 10-20 cps the spectral noise levels, according to the data of the first hydrophone, increases 10-12 decibels when the frequency is lowered an octave; according to the data of the second hydrophone, 3.5-5.0 decibels in all.

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2. V. I. Dunin-Barkovskiy, N. V. Smirnov. "Theory of Probability and Mathematical Statistics in Engineering. General Discussion". Moscow, GTTI, 1955.

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USSR

BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

3. D. I. Blokhintsev. "Acoustics of Inhomogeneous Moving Media". Moscow-Leningrad, Gostekhizdat, 1946.

Submitted for publication 23 April, 1970.

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Measuring, Testing, Calibrating, Control

USSR

UDC 534-14

BARDYSHEV, V. I., VELIKANOV, A. M., GERSHMAN, S. G., Acoustics Institute, Academy of Sciences, USSR, Moscow

"Some Experimental Investigations of Underwater Ocean Noises"

Moscow, *Akusticheskiy Zhurnal*, Vol 16, No 4, 1970, pp 602-603

Abstract: According to experimental data obtained earlier, at frequencies below 10-30 Hz the spectral density of underwater ocean noises increases, as the frequency is decreased, on an average by 8-12 db per octave. The supposition has been made that the indicated rise in the energy of underwater noise at low frequencies is brought about by the direct action of turbulent pulsations of hydrodynamic pressure upon the hydrophone when a stream of water flows around it ("pseudosound"); this occurs if the hydrophone is situated in a zone of action of underwater currents or is moved with respect to the thickness of the water. If this supposition is valid, it follows that when underwater noise is measured in the zone of action of underwater currents by a hydrophone protected by a fairing, which decreases the level of

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USSR

BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal, Vol 16, No 4, 1970, pp 602-603

the pseudosound, the intensity of the underwater noise at low frequencies will be less than when the measurements are made by a hydrophone that is unprotected against the action of the stream. This effect was actually detected in the experimental investigations of underwater ocean noise dealt with in the article. The experimental equipment and procedure are described, and the results are summarized. 1 table, 2 figures, 3 bibliographic entries.

2/2

1/2 008 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ON NEOTECTONICS OF OLD STRUCTURES IN BLOCKS IN THE MOGILYOV DNIESTER AREA -U-

AUTHOR-(02)-VELIKANOV, V.A., IVANCHENKO, V.YA.

COUNTRY OF INFO--USSR

SOURCE--DOPOVIDI AKADEMIY NAUK UKRAYNS'KOY RSR, SERIYA B, GEOLOGIYA, GEOFIZIKA, KHIMIYA TA BIOLOGIYA, 1970, NR 1, PP 3-6

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--TECTONICS, GEOLOGY, GEOLOGIC MAPPING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1548

CIRC ACCESSION NO--AT0130460 STEP NO--UR/0442/70/000/001/0003/0006

UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0130460

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AS A RESULT OF STUDYING THE MOGILYOV DNIESTER AREA NEOTECTONICS, ON THE BASIS OF A COMPLEX USE OF MAPPING BORING MATERIALS, RESULTS OF AEROPHOTOMATERIAL DECIPHERING AND RIVER LONGITUDINAL PROFILE ANALYSIS, A WIDE MANIFESTATION IS ESTABLISHED OF MODERN DIFFERENTIATED MOVEMENTS OF BLOCKS. THE NEOTECTONIC STRUCTURES REFLECT A BLOCK CHARACTER OF THE LOWER STRUCTURAL STAGE TECTONICS AND IN MOST CASES THEY WILL INHERIT PLAN CONTOURS AND MOVEMENT MARK OF THE OLD STRUCTURES. THE USED PROCEDURE MAY BY SUCCESSFULLY APPLIED FOR FINDING ABYSSAL TECTONIC STRUCTURES UNDER THE DNIESTER AREA CONDITIONS. FACILITY: TREST KIYVGEOLOGIYA.

UNCLASSIFIED

USSR

VELIKANOV, V. M., ROZENBERG, G. I., KUZNETSOV-FETISOV, L. I.

"Study of the Mechanism of Adsorption of Nitrogen Dioxide on Silica Gel by IR Spectroscopy. Report I. Method and Preliminary Results"

Tr. Kazan. Khim.-tekhnol. In-ta [Works of Kazan Institute of Chemical Technology], No 46, 1971, pp 174-180, (Translated from Referativnyy Zhurnal, Khimiya, No 2, 1972, Abstract No 2 B1387 from the Resume).

Translation: An installation is created, suitable for measurement of IR spectra of corrosive gases adsorbed on solid adsorbents. A method is developed for production of thin films of silica gel, suitable for the study of processes of adsorption by IR spectroscopy. An absorption band is observed at 1,710 cm^{-1}, belonging to the product of adsorption of NO_2 and N_2O_4 on silica gel, and an attempt is made to attribute it.

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USSR

VYBORNOV, V. G. and VELIKANOVA, N. P. UDC 539.3:534.1

"An Experimental Investigation of the Stability of Slanting Conical Panels Under the Action of External Uniform Pressure"

Kazan', Issled. po teorii plastin i obolochek, No 9 (Investigations on the Theory of Plates and Shells, Collection of Works), Kazan' University, 1972, pp 219-228 (from Referativnyy Zhurnal -- Mekhanika, No 4, 1973, Abstract No 4V424 by E. I. Sokolov)

Translation: The results of an experimental investigation on the stability of slanting conical panels under the action of external uniform pressure are presented. The slanting conical panels are bounded by two conical shell guides and two spiral lines, intersecting the cone surfaces at an angle (beta) of 45°. The stability of slanting conical panels with a diameter less than the base $2R_1=300$ mm, the angle of taper 2 gamma = 90° and the ratio $R_1/R_0 = 1.5$, 3.0 was investigated. The pressure p_{kr1}, corresponding to the appearance of the first wave bulge, the wave number n, the pressure of reverse exhaust p_{kr}, the pressures p_{kr2}, p_{kr3}, ..., corresponding to the appearance of the second, third etc. waves, the wave length and the critical load p_{max}, corresponding to the maximal wave number n_{max} were recorded for the panels. An analysis of the

USSR

VYBORNOV, V.G. and VELIKANOVA, N. P., Issled. po teorii plastin i obolochek, No 9, 1972, pp 219-228

multiple experimental data, obtained for the panels of aluminum foil and steel K40HXM tape was conducted. For calculating the critical pressure for the slanting conical panels a formula for the critical pressure of straight conical panels is proposed, from which the parameter $t=\ln(R_1/R_0)$ is excluded, while a correcting function $\phi(\alpha, \beta)$ is introduced, where alpha is the angle of the lower base of the panel (during the experiments alpha changed by 5° in the limits $15^\circ \leq \alpha \leq 35^\circ$). On the basis of the experimental data, values of the correcting functions $\phi(\alpha,\beta)$ were obtained for panels with beta equalling 45°. The results of experimental investigations of uniform external pressure on straight conical panels made of the same materials as the slanting conical panels are also presented. An analysis of the functions of straight and slanting panels is given. It is shown that the critical loads for slanting conical panels significantly exceed the critical loads for straight conical panels with equal angles alpha and equal base radii R_1 and R_0.

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009

UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--PHOSPHORUS CERIUM MOLYBDENUM HETEROPOLY COMPLEX -U-

AUTHOR-(02)-BARKOVSKIY, V.F., VELIKANOVA, T.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(3), 749-52

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SPECTROPHOTOMETRIC ANALYSIS, CERIUM COMPOUND, MOLYBDENUM COMPLEX COMPOUND, PHOSPHORUS COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1993/0679

CIRC ACCESSION NO--AP0113550 STEP NO--UR/0038/70/015/003/0749/0752

UNCLASSIFIED

009

CIRC ACCESSION NO--AP0113550

UNCLASSIFIED

PROCESSING DATE--16OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FORMATION OF P-CE-MO COMPLEX (I) IN HNO SUB3 SOLN. WAS STUDIED SPECTROPHOTOMETRICALLY. I FORMED IN 0.2-0.4N HNO SUB3. AT SMALLER THAN 0.2N HNO SUB3 CONCN., A DOUBLE SALT OF CE-MO PPT. AND AT GREATER THAN 0.6N HNO SUB3 CONCN., THE INTENSITY FO THE EXPTL. AND BLANK SOLNS. INCREASED DRASTICALLY. WHEN SNCL SUB2 WAS ADDED TO I SOLN. IN 0.6N H SUB2 SO SUB4 A BLUE PRODUCT FORMED. I HAS A 2:1 CE:P RATIO. FACILITY: URAL. GOS. UNIV. IM. GOR'KOGO, SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

YEREMENKO, V. N., and VELIKANOVA, T. YA., Poroshkovaya Metallurgiya, No 9, Sep 70, pp 57-61

been calculated. Polythermal sections of the Mo-TiC-Ti system with 20 and 30 at.% C have been plotted. It was found that the boundary of the homogeneity region of the δ-phase in the Mo-TiC section over the 1700°C region lies at 46 at.% Ti and 46 at.% C; the boundary of the homogeneity region in the 1400°C is at 46.5 at.% Ti and 46.5 at.% C.

UDC 621.721.541.121

USSR

YEREMENKO, V. N., and VELIKANOVA, T. YA., Institute of Problems of Material Science, Academy of Sciences Ukrainian SSR

"Phase Equilibria in the Molybdenum-Titanium Carbide-Titanium Region of the Ternary System Molybdenum-Titanium-Carbon. Communication 2"

Kiev, Poroshkovaya Metallurgiya, No 9, Sep 70, pp 57-61

Abstract: Use has been made of metallography and x-ray phase analysis of hardened alloys to study phase equilibria at 1400°C in the Mo-Ti-C system. It is shown that the direction of conoids in the two-phase (δ+β) region which is formed by cubic carbide and metallic solid solutions is parallel to the quasi-binary Mo-TiC section of the Mo-Ti-C ternary system over a wide range of compositions of carbide and metallic phases and does not depend on temperature (from the solidus surface). The distribution coefficient of components in the δ+β two-phase region at the solidus surface (K=34±8) within 20 to 58 at.% of titanium contents along the section of 20 at.% has

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UNCLASSIFIED PROCESSING DATE--18SEP70

1/2 026

TITLE--LOW TEMPERATURE MODIFICATION OF THE LOWER MOLYBDENUM CARBIDE -U-

AUTHOR-(04)-YEREMENKO, V.N., VELIKANOVA, T.YA., LISTOVNICKIY, V.YE.,
KOMAROVA, S.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(1), 11-14

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--MOLYBDENUM COMPOUND, CARBIDE, X RAY DIFFRACTION, CRYSTAL STRUCTURE, THERMAL EFFECT, ELECTRIC RESISTIVITY, THERMOGRAPHIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0151

STEP NO--UR/0363/70/006/001/0011/0014

CIRC ACCESSION NO--AP0054947

UNCLASSIFIED

2/2 026
CIRC ACCESSION NO--AP0054947
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMOGRAPHIC AND X RAY
DIFFRACTION METHODS WERE USED. DURING X RAY DIFFRACTION INVESTIGATION
OF MO-C ALLOYS, CAST AND ANNEALED IS GREATER THAN 1200DEGREES (WITH C
CONTENT 12.538 AT. PERCENT AT IS LESS THAN 1634DEGREES AND UP TO 50 AT.
PERCENT C AT LOWER TEMPS.), ONLY THE PSEUDOHEXAGONAL LATTICE WAS OBSD.
FOR THE MO SUBC-BASED PHASE, WITH THE PARAMETERS: ALPHA EQUALS 2.993, C
EQUALS 4.739 KX, AND C-A EQUALS 1.58 (AT 31 AT. PERCENT C); AND ALPHA
EQUALS 3.015, C EQUALS 4.739 KX, AND C-A EQUALS 1.57 (AT 33.75 AT
PERCENTC). A PHASE TRANSITION WAS OBSD.-AT 1170 PLUS OR MINUS 13DEGREES
IN THE LOWER MO CARBIDE MO SUB2 C, ACCOMPANIED BY AN EXOTHERMAL EFFECT
(DURING COOLING) WITH A SIGNIFICANT TEMP. HYSTERESIS. A DECREASE IN
THE SYMMETRY OF THE CRYST. LATTICE, I.E. RHOMBOHEDRAL DISTORTION OF THE
ORTHORHOMBIC MO SUB2 C STRUCTURE, IS OBSD. THE MO CARBIDES STUDIED HAD
THE COMPNS. OF MOC SUB0.48 AND MOC SUB0.51, RESP. EXPTS. WERE PERFORMED
RELATIVE TO THE MEASUREMENT OF SP. ELEC. RESISTIVITY OF MOC SUB0.48 AS
DEPENDENT ON THE QUENCHING TEMP. WITHIN THE TRANSITION TEMP. RANGE. THE
ELEC. RESISTIVITY OF THE ALLOY QUENCHED FROM 1400DEGREES DOES NOT DIFFER
FROM THE ELEC. RESISTIVITY OF THE CAST ALLOY. WITH DECREASED QUENCHING
TEMP. THE ELEC. RESISTIVITY DECREASES TO 1050DEGREES, WHERE UPON IT
REMAINS UNCHANGED. THE DEPENDENCE OF THE P VALUE ON THE QUENCHING TEMP.
OF THE SAMPLE CAN BE ASSOCD. WITH THE CHANGE IN ITS CRYST. STRUCTURE.
AN ADDNL. THERMAL EFFECT WAS OBSD. AT 1634DEGREES.

1/2 025 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--UPPER LIMIT OF THE HOMOGENEITY REGION OF (TI, MO) AND C SUBL MINUS
X SOLID SOLUTIONS -U-

AUTHOR-(03)-YEREMENKO, V.N., VELIKANOVA, T.YA., SHABANOVA, S.V.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(1) 6-10

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--SOLID SOLUTION, MOLYBDENUM COMPOUND, TITANIUM COMPOUND,
CARBIDE, GRAPHITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED STEP NO--UR/0363/70/006/001/0006/0010

PROXY REEL/FRAME--1984/0149

CIRC ACCESSION NO--AP0054945

UNCLASSIFIED

PROCESSING DATE--18SEP70

UNCLASSIFIED

2/2 025

CIRC ACCESSION NO--AP0054945

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE UPPER LIMIT OF THE HOMOGENEITY
REGION OF (TI, MO) C SUBL MINUS X SOLID SOLNS. IN THE MO,TI,C SYSTEM WAS
DETD. ALLOYS WERE INVESTIGATED, THE COMPNS. OF WHICH FALL INTO THE
COEXISTENCE REGION OF GRAPHITE AND THE CARBIDE PHASES AND IN THE MOC
SUB0.SUB64 MINUS TIC SECTION OF THE PHASE DIAGRAM. THE ALLOYS TO BE
STUDIED WERE PREPD. BY ARC MELTING IN A PROTECTIVE AR ATM. AND WERE
ANNEALED IN VACUO IN GRAPHITE CONTAINERS. THE INITIAL MATERIALS WERE
99.7PERCENT MO POWDER, TIC (CONTG. 18.7PERCENT COMBINED C AND 0.4PERCENT
FREE C), AND SPECTRALLY PURE GRAPHITE. X RAY PHASE, MICROSCOPIC, AND
CHEM. ANAL. METHODS WERE USED. THE PHASE COMPN. OF THE ALLOYS AT THE
SURFACE OF THE SOLY. OF C IN CARBIDE PHASES OF THE MO,TI,C SYSTEM WAS
INVESTIGATED. BY EXTRAPOLATING THE CONCN. DEPENDENCE OF THE LATTICE
PARAMETERS OF THE CUBIC SOLID SOLNS. (TI,MO) C SUBI MINUSX TO 0PERCENT
TI, THE VALUE FOR THE LATTICE PARAMETERS OF THE CUBIC ALPHA-MINUS MOC
SUBI MINUSX WAS 4.266 KX AT 40 AT. PERCENTC, AND 4.243 KX AT 38 AT.
PERCENTC.

UNCLASSIFIED

Ref. Code: UR 0660

Acc. Nr: AP0044104

PRIMARY SOURCE: Neyrofiziologiya, 1970, Vol 2, Nr 1 , PP 43-51

ROLE OF RETICULAR FORMATION OF THE BRAIN STEM DURING THE PROCESS OF FORMATION OF BACKGROUND ACTIVITY OF CORTEX NEURONS

R. R. Velikaya, T. M. Sycheva

The A. A. Bogomoletz Institute of Physiology.
Academy of Sciences. Ukrainian SSR, Kiev

Summary

Background activity of the rabbit visual cortex neurons is inhibited after the section produced of the rostral part of the midbrain reticular formation. Electrolytic lesion of the midbrain reticular formation (nucleus reticularis tegmenti) gives rise to a decrease in frequency and an increase in grouping of spikes of cortical neurons. Substantial changes in impulsation of cortical neurons caused by lesion of specific nuclei of the optic pathway (lateral corpus geniculatum and superior colliculi) were not observed.

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REEL/FRAME
19770575

AP0044104

A comparison of impulse activity parameters of the same cortical neurons recorded before and after functional blocking of the midbrain reticular formation showed an increase in the spike grouping following the reticular formation blockade. It is produced by changes in intervals between impulse groups; the spike frequency within groups is not changed. The data obtained suggest that the midbrain reticular formation might play an important role in the cortical background activity generation as a trigger which determines the appearance of spike groups. The distribution of activity within the groups appears to be connected with cortical mechanism only.

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19770576

VELIKAYA, S.M.

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103

VAN # 9 1973
JPRS 60661 30 Dec 73

HISTORY OF MECHANICS FROM THE END OF THE 18TH TO THE MIDDLE OF THE 20TH CENTURY

NC

[Book review by Academician of the AS Ukrainian SSR G. N. Savin and Candidate of Physical and Mathematical Sciences S. M. Velikaya; Moscow, Vestnik Akademii Nauk SSSR, Russian, No 9, September 1973, pp 146-147]

ISTORIYA MEKHANIKI S KONTSA XVIII V. DO SEREDINY XX V. (English version above). General editors, A. T. Grigor'yan and I. B. Pogrebysskiy (deceased). Moscow, Izd-vo Nauka, 1972, 414 pages, 4000 copies, 2 r 94 k.

The reviewed monograph is actually the second volume of a work published earlier (in 1971), devoted to the history of mechanics from the earliest times to the end of the 18th century. During its preparation the authors encountered certain difficulties connected mainly with the lack of development of problems of the history of mathematics and mechanics of the 20th century, and in particular the history of applied mechanics. The reviewed book is one of the few in which an attempt is made to examine problems of applied mechanics in connection with the development of the problems of theoretical and analytical mechanics.

In the first chapter, devoted to analytical mechanics, is a discussion of the essence of the mathematical theories developed in the course of the 19th century by K. Jacoby, M. V. Ostrogradskiy, D. Poisson, H. Hertz, J. Gibbs, S. V. Kovalevskaya and S. A. Chaplygin. The author (L. N. Sretenskiy) shows that actually the entire theoretical mechanics of the 19th century proceeded under the banner of the works of W. Hamilton, who proposed new methods of integration of differential equations of analytical mechanics. Let us note here that a chapter entitled "Theory of screws in noneuclidean mechanics" (A. T. Grigor'yan and B. A. Rozenfel'd) has been included in the book which links the method of quaternions of Hamilton with the theory of screws, which has found wide application in the study of spatial mechanisms.

8

JPRS 59459

9 July 1973

FEASIBILITY OF GENERATING MEGAGAUSS MAGNETIC FIELDS USING HIGH-PRESSURE COMPRESSED GAS LININGS

[Article by Ye. P. Velikhov, A. A. Vedenov, A. D. Bogdanets, V. S. Golubev, Ye. G. Kasharskiy, A. A. Kiselev, F. G. Rutberg, V. V. Chernukha; Leningrad, Zhurnal Tekhnicheskoy Fiziki, Russian, Vol 43, No 2, 1973, signed to press 8 June 1971, pp 429-438]

The results of calculation of a setup, designed for generating a megagauss pulse magnetic field in a large volume, are presented in this article. The magnetic field is amplified by compression in a cylindrical metal case, pushed by high-pressure gas (1,000-2,000 atm). The expected energy in the compressed magnetic field is several MJ and the lifetime of the field is of the order of 10 μsec. In contrast to apparatus using explosives, the examined device is nondestructive; in contrast to devices used for compressing a shell with the energy of an electromagnetic field, the examined system does not experience the problems of super-power storage units and electromagnetic energy commutators.

Introduction

Pulsed megagauss fields, especially in a large volume and with high (~1 MJ and above) energies, are very important in modern industry. Thus, they may be used for solving the problem of controlled thermonuclear synthesis [1], investigating matter at superhigh pressures [2], generating a pulse of electromagnetic energy at high power and energies (10^{11}-10^{13} W, 10^{8}-10^{9} J). The literature contains the results of analysis of pulsed megagauss fields by collapsing a metal case using explosives [3] or the energy of a capacitor bank [4-6]. The use of explosives is technologically difficult and leads to total destruction of the system; the use of capacitor banks is limited for practical purposes to the energy level of 10^{6}-10^{7} J.

The use of the energy of compressed gas for collapsing a cylindrical metal shell (liner), amplifying a magnetic field by "adiabatic" compression

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VELIKHOV, Ye. P.

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by the conducting cylinder, the generatrices of which are parallel to the magnetic force lines, is considered promising. The advantages of this method are: 1) the system is nondestructive; the mechanical requirements on strength are the same as in the case of the apparatus that uses electromagnetic energy, since the magnetic pressure that collapses the liner must have the same magnitude (1,000-2,000 atm); 2) rapid application of external pressure on the liner in the examined system does not require the development of high-power commutating systems; the electromagnetic set-up requires presently unavailable storage units and electromagnetic energy commutators (10^5-10^6 J, 10^{11}-10^{12} W); explosive systems require synchronous actuation of the detonators; 3) the use of compressed gas makes it possible to attain more efficient transmission of energy to thr field in comparison with explosives and current inductive storage systems.

The most important part of the pneumatic apparatus is the system for breaking a cylindrical diaphragm that holds back all the gas pressure (by means of a cylindrical support grill). Our apparatus incorporates a high-speed magnetic "theta-pinch" type coil [7], which generates the pulse that releases magnetic pressure.

In contrast to electromagnetic systems, the rate of collapse of the liner in a pneumatic system is limited to the speed of sound in gas. When hydrogen is used at room temperature a radial liner velocity of 10^4 cm/sec is completely feasible and is attainable for most applications. Thus, in the case of thermonuclear experiments (compression of deuterium plasma in a magnetic field), the characteristic time of adiabatic compression is determined by a velocity of ~10^6 cm/sec, which, finally, requires a very long magnetic field [8].

§1. Description of Apparatus

The apparatus for storing and converting energy (Figure 1) consists of steel body 5, which houses support grate 3 and steel diaphragm 2, installed on it. In the cavity between the diaphragm and the body is gas (H_2 or He) under a pressure of 1,000-2,000 atm.

The diaphragm is a thin-wall steel cylinder with a wall thickness of the order of 1 mm, which is necessitated by the need for rapid and synchronous opening of all parts of the diaphragm (§2).

Magnetic diaphragm rupture system 4 consists of six turns (§5), wound on insulators. The design of the elements of the magnetic system is illustrated in Figure 2.

The diaphragm rupture system is powered by pulsed capacitors through coaxial sealed cables 6, insulated for 50 kV. Inside the support grate, at a distance of 1-2 mm from its inner surface, is copper liner 1, 140 mm in diameter with a wall thickness of 1-2 mm. An initial magnetic field (B_{in} = $1.2 \cdot 10^5$ G) is developed beforehand in the cavity of the liner.

UDC 550.837.73

USSR

BULGAKOV, YU. I., VELIKIN, A. B., GRIGOR'YEV, G. O., POLIKARPOV, A. M.

"Device for Inductive Geoelectric Exploration by the Transient Process Method"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 16, 8 May 70, p 61, Patent No 270122, Filed 2 Mar 63

Translation: This Author's Certificate introduces a device for inductive geoelectric exploration by the transient process method. The device comprises a generator and measuring assembly containing a receiving loop, a commutator, an amplifier and a recorder. It is distinguished by the fact that in order to improve the sensitivity and resistance to low-frequency noise when measuring steady-state low voltages, a level index and two or several synchronous filters connected with it are connected to the output of the pulse amplifier in the measuring assembly.

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UNCLASSIFIED PROCESSING DATE--18SEP70

1/2 010

TITLE--THE EFFECT OF PINOCYANOLE OF T SUB2 AND C SUB0 BACTERIOPHAGES -U-

AUTHOR-(03)-VELIKODVORSKAYA, G.A., GUSHCHIN, B.V., KLIMENKO, S.M.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 2, PP 204-207

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--BACTERIOPHAGE, BIOLOGIC STRAIN, BACTERIAL DEOXYRIBONUCLEIC ACID

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED STEP NO--UR/0402/70/000/002/0204/0207

PROXY REEL/FRAME--1990/0734

CIRC ACCESSION NO--AP0108940

UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0108940

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INTERACTION OF A STAIN OF THE CYANINE SERIES, PINOCYANOLE, WITH T SUB2 AND C SUBD BACTERIOPHAGES WAS STUDIED. PNC WAS FOUND TO PENETRATE WELL THROUGH THE ENVELOPE OF INTACT PHAGE PARTICLES AND TO INERACT WITH INTRAPHAGE DNA. MORPHOLOGICAL CHANGES OF PHAGES WERE VERY SLIGHT. THE INFECTIOUS ACTIVITY OF C SUBD PHAGE UNDER THE INFLUENCE OF PNC WAS REDUCED BY 35PERCENT, THAT OF T SUB2 PHAGE BY 25PERCENT.

UNCLASSIFIED

USSR

LYASHKO, I. I., VELIKOIVANENKO, I. M., and MISTETSKIY, G. YE.

"One Type of Problem in Planned Percolation From Channels to Intermittent Drainage in Inhomogeneous Soils"

Kiev, Matematicheskaya Fizika, No 8, 1970, pp 112-117

Abstract: The article considers problems in the planned steady pressureless percolation of a heavy incompressible fluid from parallel channels to intermittent perfect drainage. Numerical-analytic solutions are constructed.

1/2 024 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--KINETICS OF THE STRESS STRAIN STATE DURING THE WELDING UP OF A
CRACK IN A THIN PLATE -U-
AUTHOR-(03)-MAKHNENKO, V.I., VELIKOIVANENKO, YE.A., SHEKARA, V.M.

COUNTRY OF INFO--USSR

SOURCE--AVTOMAT. SVARKA, FEB. 1970, (2), 36-40

DATE PUBLISHED--------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS

TOPIC TAGS--METAL CRACKING, WELDING, METAL STRESS, STRAIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0312 STEP NO--UR/0125/70/000/002/0036/0040

CIRC ACCESSION NO--AP0124071
UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AP0124071
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETIC CHANGES TAKING PLACE IN THE STRESS, STRAIN, AND TEMP. DISTRIBUTIONS AROUND CRACKS IN METAL PLATES DURING WELDING UP OPERATIONS ARE DISCUSSED ON THE BASIS OF THEORETICAL CALCULATIONS AND EXPERIMENTAL TESTS. IN THE REGION IMMEDIATELY SURROUNDING THE WELD COMPRESSIVE STRAINS TEND TO DEVELOP, WHILE IN THE COOLING STAGE TRANSVERSE STRAINS CHANGE LESS RAPIDLY WITH TIME THAN LONGITUDINAL STRAINS. THE PRACTICAL IMPORTANCE OF THESE AND OTHER FACTORS WHEN WELDING UP CRACKS IS INDICATED.

UNCLASSIFIED

USSR UDC 669.295.046.78

[redacted], BEREZHNOY, N. N., BUGAYENKO, V. A., BERNADO, V. F., VOSKERICHYAN, A. KH.

"Study of the Magnetic Properties of the Processof Slag Pelletizing"

Sb. nauch. tr. N.-i. i proyekt. in-t po obogashch. i aglomer. rud chern. met. (Collected Scientific Works of the Scientific Research and Planning Design Institute with Respect to Beneficiation and Sintering of Ferrous Metal Ores), 1971, vyp. 15, pp 54-56 (from RZh-Metallurgiya, No 4, Apr 72, Abstract No 4G210)

Translation: The laboratory studies at the Mekhanobrchermet Institute with respect to pelletizing Ti slag and Fe and Ti concentrates established the possibility of obtaining pellets of satisfactory strength. One illustration and 1 table.

USSR UDC: 681.45

TSUKKERMAN, S. T., VELIKOTNYY, M. A., Leningrad Institute of Precision Mechanics and Optics

"On the Possibility of Using Photodiodes in Beam Control Devices"

Leningrad, Izvestiya VUZov: Priborostroyeniye, Vol 15, No 12, 1972, pp 89-92

Abstract: The paper deals with the possibility of using gallium arsenide photodiodes in miniature beam control devices. Epitaxial photodiodes of planar and hemispherical design were investigated with an emission power of 2-10 mW (at a supply current of 100 mA), and a PN junction measuring 0.3 x 0.3 mm. The calculations are experimentally confirmed. It is concluded that it is feasible to make beam control devices with photodiode power sources of about 2 mW for operation at a distance of up to 50 m with a precision of at least 0.5 mm. The range of operation can be extended by using photodiodes with higher power.

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USSR UDC: 621.382.2

VELIKOTNYY, M. A.

"Measuring Power and Radiation Diagrams of GaAs Crystalline Light-Emitting Diodes"

Leningrad, Priborostroyeniye, No 4, 1972, pp 101-106

Abstract: The purpose of this paper is to describe measurement of the integral power and a method of plotting the directional diagrams of light radiated from GaAs diodes. Characteristics of flat and spherical diodes are compared and typical directional diagrams for each are shown. A device for measuring the power and directional diagrams of the diodes is presented, together with a diagram of the equipment involved and an explanation of its operation and use. This device is superior to the hitherto-used method of measuring the radiated light power in that it takes into account the radiation diagram and the reflection losses at large incident angles which significantly reduce the integral power. It can also be used to measure the power and plot the radiation diagram of small-dimensioned infrared sources. The results of measurements of tens of spherical "diffusion" diodes are given. The author is associated with the Leningrad Institute of Precision Mechanics and Optics.

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ELECTRONICS

Amplifiers

USSR

UDC: 621.375.4

GORBATOV, A. A., SAMSONOV, A. A., VELIKOV, L. V., RUDASHEVSKIY, YE, G.,
Physics Institute, Academy of Sciences of the USSR, Moscow

"A Low-Noise Transistorized Amplifier"

Moscow, Pribory i Tekhnika Eksperimenta, No 2, Mar/Apr 70, pp 134-135

Abstract: The authors describe a transistorized amplifier with an inherent noise level of about 2 microvolts in the 10 Hz-30 kHz frequency band. The voltage gain for various measurement conditions varies over a range of 100-1000. The power to the amplifier is supplied by galvanic cells or storage batteries. Because of its small overall dimensions, the amplifier can be connected in cable lines and located close to the signal source. A small batch of amplifiers has been in satisfactory operation for about a year. The entire unit is accomodated in a box measuring 40 x 100 x 18 mm.

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USSR

UDC:662.232.1+534.222.2

GORDEYEV, V. Ye., MATVEYEV, Yu. S., [redacted], Moscow

"Influence of Initial Temperature on Velocity of Low-Speed Detonation in Nitroglycerin"

Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 352-358

Abstract: The spin hypothesis of slow detonation in nitroglycerin has been strongly supported by the first detonation imprints of low speed nitroglycerin detonation. However, this should indicate that even comparatively slight changes in the initial temperature of the material reacting in the detonation wave should lead to noticeable changes in detonation parameters. The purpose of the present work was experimental investigation of these changes. The results of the experiments do not allow an unambiguous conclusion to be drawn concerning the nature and mechanism of propagation of detonation in nitroglycerin at low velocity. However, they do indicate that the sensitivity of nitroglycerin to cavitation does not determine the value of the low detonation speed. They also indicate that the cavities in nitroglycerin detonating at low speed result from oscillations propagating in the liquid itself, not along the vessel walls.

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USSR

UDC: 681.325.3

ATSYUKOVSKIY, V. A., VELIKSON, Ya. M., KULIKOV, I. V.

"A Multichannel Angle-to-Code Converter"

USSR Author's Certificate No 328493, filed 3 Jul 70, published 11 Apr 72 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 1, Jan 73, abstract No 1B471 P)

Translation: A multichannel angle-to-code converter is proposed which contains sine-coisine pickups connected through an input commutator and paraphase amplifiers to an octant commutator. The octant commutator is connected to the input of a decoding code-to-voltage converter, to the input and output of an octant register, to one of the inputs of a comparison unit, and to one of the outputs of a distributor. The second output of the distributor is connected through a control register and the decoding code-to-voltage converter to the other input of the comparison unit. The output of the comparison unit is connected to the octant register and the control register.

To increase conversion accuracy and extend functional possibilities, the converter contains a reading characteristic module, connected to the control register, and an automatic synchronization module whose inputs are connected

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USSR

ATSYUKOVSKIY, V. A., et al., USSR Author's Certificate No 328493

to the outputs of the paraphase amplifiers, while the output is connected to the input of the distributor. The multichannel angle-code converter is distinguished by the fact that the automatic synchronization module is made in the form of a summing amplifier, control element, and flip-flop connected in series.

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USSR

NAUMOV, L.S., PROZOROV, A.A., SAVCHENKO, G.V., and VELIKZHANINA, G.A., All Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

"Comparative Study of Induced Mutagenesis in Rec$^+$ and Rec$^-$ Strains of Bacillus subtilis"

Moscow, Genetika, Vol 6, No 3, 1970, pp 51-58

Abstract: In previous works, mutants of B. subtilis with disrafted recombination and elevated sensitivity to various mutagens were described. It was observed that mutations were localized in the same part of the chromosome. Experiments on the mutagenic influence of diethylsulfate and embichine 7 on the initial and rec strains are described. The number of auxotrophic mutations in the strain Bacillus subtilis rec 149 was greater than in the initial strain. This may be due to errors in syntheus of reparative DNA in rec-strains.

VELINOV, Ivan

Space

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GAMMA-RADIATION OF THE MOON AND COMPOSITION OF THE LUNAR ROCKS FROM MEASUREMENTS BY LUNA-10

by Ivan Velinov

A description is given of the instrumentation carried on board the Luna-10 automatic station, and data are presented on the intensity of the gamma radiation emitted from the lunar surface.

Introduction

The Luna-10 automatic station, which was placed into a lunar orbit on 3 April 1966, was equipped with a 32-channel scintillation γ-spectrometer to investigate the intensity and spectral composition of the γ-radiation emitted from the lunar surface. Some of the preliminary results obtained from this investigation were given in [1, 2, and 3].

The present paper will describe the scintillation γ-spectrometer used on Luna-10 and present additional data on the spectral composition and intensity of the γ-radiation measured over different regions of the lunar surface. Also, the basic sources of lunar γ-radiation (γ-radiation from the nuclear disintegration of the natural elements contained in lunar rocks and γ-radiation due to the interaction between cosmic rays and the lunar soil) will be examined.

Instrumentation

The γ-spectrometer (see Fig. 1) was located in a hermetically sealed compartment of Luna-10 and consisted of a scintillation transducer and a multichannel amplitude analyzer [4]. The transducer was cylindrically shaped (diameter, 55 mm; length, 180 mm) and used a cylindrical (diameter, 28 mm; length, 38 mm) NaI (Tl) single-crystal detector (see Fig. 2). To eliminate the background from charged particles (primarily protons), the NaI (Tl) crystal was enclosed in a 3-mm-thick plastic scintillator container. Silicon cement was used to obtain optical contact between the laminated phosphor and the FEU-16 photomultiplier tube used in the transducer. The photomultiplier tube was shielded from the effects of weak magnetic fields by a

Library Congress, ATD, Foreign Science Bulletin
Vol 4, No. 9, Sep 1968

1/2 008 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--DEGAZATION OF THE UPPER MANTLE SUBSTANCE AS THE MAIN FACTOR OF MAGMA FORMATION -U-

AUTHOR--VELINSKIY, V.V.

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COUNTRY OF INFO--USSR

SOURCE--GEOLOGIYA I GEOFIZIKA 1970, NR 1 (121) PP 10-21

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--UPPER MANTLE, MAGMA, EARTH CRUST, EARTH MANTLE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1986/1317 STEP NO--UR/0210/70/000/001/0010/0021

CIRC ACCESSION NO--AP0103199

UNCLASSIFIED

CIRC ACCESSION NO--AP0103199

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW OF EXISTED HYPOTHESES OF MAGMA FORMATION IS GIVEN AND NEW MODEL OF MAGMATIC CHAMBERS FORMATION WITHIN THE CRUST AND UPPER MANTLE EFFECTED BY GAS "FLOWS" IS CONSIDERED. THE LATTER ARE FORMED WITHIN THE PERMEABILITY ZONES OF DEEP LOCATION IN RESULT OF INTENSIVE DEGAZATION OF THE UPPER MANTLE SUBSTANCE IN THE LIMITS OF THESE ZONES. THE THERMOPHYSICAL CALCULATIONS WERE CARRIED OUT FOR ELUCIDATION OF POSSIBILITY OF SUCH MAGMA FORMATION MECHANISM, THE STEPHAN PROBLEM FOR BOUNDARY CONDITIONS OF THE SECOND KIND HAS BEEN SOLVED. THE RESULTS OF THESE INVESTIGATIONS AND THEIR GEOLOGICAL INTERPRETATION ARE DISCUSSED.

USSR

UDC: 669.14

MAKAROVA, V. I., VELISHCHANSKIY, A. V., LESHKOVTSEVA, I. G.

"Influence of Heat Treatment and Cold Plastic Deformation on Temperature Frequency Factor of Longitudinal Oscillations of Type 44NKhTYu Alloy"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Mashinostroyeniye, No 9, 1973, pp 136-139.

Abstract: This work presents a study of the influence of heat treatment and cold plastic deformation on the component of the thermoelastic factor determined by the chemical composition of the basic solid solution. The influence of aging modes and degree of cold plastic deformation on the temperature factor of resonant frequency of longitudinal oscillations in 44NKhTYu alloy was studied in the presence of a magnetic field near the saturation field. It was established that cold plastic deformation with over 50% compression and subsequent aging at temperatures up to 650° C increases the value of the temperature frequency factor. Changes in the heat treatment mode and degree of cold plastic deformation result in changes of the frequency factor within limits of 10×10^{-6} 1/° C in the presence of a strong magnetic field.

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1/2 029 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--ENERGETICS OF THE FUTURE -U-

AUTHOR--VELIYEV, M.

COUNTRY OF INFO--USSR

SOURCE--VYSHKA, AUGUST 6, 1970, P 2, COLS 4-7

DATE PUBLISHED--06AUG70

SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE), MECH., IND., CIVIL AND MARINE ENGR
TOPIC TAGS--THERMOELECTRIC GENERATOR, THERMOELECTRIC EQUIPMENT, CORROSION INHIBITOR, UNDERWATER EQUIPMENT/(U)BETA 1 THERMOELECTRIC GENERATOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1910 STEP NO--UR/9059/70/000/000/0002/0002

CIRC ACCESSION NO--AN0125503
UNCLASSIFIED

2/2 029 UNCLASSIFIED

CIRC ACCESSION NO--AN0125503 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INSTITUTE OF PHYSICS OF THE AZERBAYDZHAN ACADEMY OF SCIENCE HAS DEVELOPED A THERMOELECTRIC GENERATOR THAT HAS A GREAT PROMISE. IT EMPLOYS A GAS BURNING ELEMENT AS A SOURCE OF HEAT, AND CAN BE USED FOR PROTECTING UNDERWATER MARINE STRUCTURES FROM CORROSION. IT IS ALSO REPORTED THAT NUCLEAR THERMOELECTRIC GENERATORS BETA-1, CAPABLE OF GENERATING POWER UP TO 200 WATTS, ARE USED BY SOVIET METEOROLOGY. FACILITY: SCIENCE ASSOCIATE, INSTITUTE OF PHYSICS OF THE AZERBAYDZHAN ACADEMY OF SCIENCES.

UNCLASSIFIED

USSR

UDC 537.312.62

VERESHCHAGIN, L. F., Academician, KONYAYEV, YU. S., BERZON, E. M., and VELLER, M. V., Institute of High-Pressure Physics, Academy of Sciences USSR, Akademgorodok, Podol'skiy Rayon, Moskovskaya Oblast

"Variation in the Superconducting Transition Temperature of Strained Niobium Stannide"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 6, 1972, pp 1270-1271

Abstract: The authors subjected rods 1.5-3 mm in diameter made of Nb-Sn alloy (64 wt. percent Nb), containing Nb_3Sn as the principal phase, to plastic strain and studied the dependence of the superconducting transition temperature T_c on the amount of strain. The strain was applied on a two-stage hydro-extrusion device in the 30-60 kbar extrusion pressure range with a counter-pressure of 15-20 kbar. The strains reached $\varepsilon = 65$ percent. T_c was determined by the inductive method. It was found that there is already a sharp decrease in T_c at light reductions ($\varepsilon = 20$-30 percent) with a significant expansion of the transition range. An analysis of X-ray photographs taken

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USSR

VERESHCHAGIN, L. F., et al., Doklady Akademii Nauk SSSR, Vol 203, No 6, 1972, pp 1270-1271

by the powder method showed that with increased strain there is broadening of the interference lines and a decrease in their intensity.

To find how T_c is affected by stresses occurring during strain, a number of anneals of varying duration were carried out at 300-900° C. It was found that the anneals significantly increase the superconducting transition temperature. There is a 3-5 percent increase in the T_c of strained specimens after annealing at 900°. Annealing of the initial specimens does not cause any sharp change in T_c. The appearance of the X-ray photographs of all specimens annealed at temperatures up to 700° C does not change; beginning with 900° there is a decrease in the width and an intensification of the Ni_3Sn line intensity, indicating internal stress relief and possibly an increase in the tin content of the compound.

The authors thank Ye. S. Itskevich and V. A. Vlasov for affording the opportunity to perform the T_c measurements.

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Acc. Nr.: AP0046866

Ref. Code: UR0122

USSR

UDC 621.824.678.5.026.37:621.787.4

VELLER, V. A., Candidate of Technical Sciences, VENGARTEN, A. M., Candidate of Technical Sciences, GOMAN, G. M., Engineer, OSTANINA, V. A., Engineer

"Fatigue Strength Increase of Rolled Shafts by Polymer Coating"

Moscow, Vestnik Mashinostroyeniya, No 1, 1970, pp 13-15

Abstract: Experimental data are presented on fatigue tests conducted on carbon steel shafts from 30 to 165 mm in diameter with a press fit, in order to evaluate the increase in the fatigue limit produced by surface rolling and by application of a polymer coating. The results show that the fatigue strength increases 1.5-2 times, and that the effectiveness of rolling increases with shaft diameter. The surface strengthening by rolling is being currently applied to propeller shafts on all ships in construction.

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Reel/Frame

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The effect of rolling on prevention of crack formation is being substantially smaller than on tensile strength. The formation of surface defects due to fretting-corrosion at the location of press-fits was observed on the ordinary and rolled samples. A polymer coating of the surface at the location of a press fit is one of the very effective procedure for lowering corrosion. A combination of rolling with polymer coating is highly recommended for reducing the intensity of fretting-corrosion.

The metallographic study of samples at the location of a press fit shows, that at the same stress levels, the application of a polymer coating substantially delays the formation of surface defects, caused by the fretting-corrosion, and by the same way, increases the durability of the part. The efficiency of polymer coating is tentatively explained by separation of contact surfaces, by protection of metallic surfaces from air action; by reduction of the stress along the edges of a press-fitted bushing.

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It is concluded that 1) the fatigue strength at the location of press fits increases 1.5-2 times, by using the surface rolling; and 2) the use of polymer coatings on rolled shafts at the location of press fits ensures an increase in fatigue strength and durability, and at first the decrease in fretting corrosion intensity. Original article has 1 figure and 2 tables.

3/3

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VEL'MIN, V. A.

JPRS 53334

10 June 1971

SOME EFFECTS DURING THE PASSAGE OF RADIO WAVES THROUGH THE REGION OF AN EXPLOSION

[Article by V. A. Vel'min, V. F. Korets, Yu. A. Medvedev and B. M. Stepanov; Moscow, Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, Russian, No 2, 1971, pp 136-139]

In this article we describe and interpret certain nonstationary effects observed in the passage of radio waves through the region of an explosion.

This interaction between radio waves and the region of an explosion is of interest in connection with the fact that study of such interaction may yield data on the processes within the explosion which could be obtained in no other way. The electromagnetic probe method possesses an unquestioned advantage over other methods (such as the simple probe method) in that, being essentially active, it does not exert a disturbing influence during the measurements (weak field).

In Figure 1, devoted to the interaction of radio waves of the centimeter range with the region of an explosion, it is shown that the specific shock wave is opaque, provided its velocity exceeds 2.4 km/sec. With any decrease in velocity, however, the shock wave becomes increasingly transparent. After a time, evidently, products of the explosion make their appearance, and the interaction of the waves with the explosion region becomes more complicated: apart from purely diffraction effects, such as appear as long as the shock wave remains ideally conductive, there sets in direct passage of the radio beams through the products of the explosion, and this in turn raises the question of the relative role of such effects in the mechanism of the interaction between wave and explosion product. If the explosion happens to be irradiated exclusively through the cross-section of the beam, and if at the point of the explosion a small number of terminal Fresnel zones exists, then enlargement in the region of the explosion will result in stepwise superimposing of the Fresnel zones, which will lead to oscillation of the energy flow at the point of receipt, the oscillation period being determined by the speed of overlapping of

VEL'MIN, V.A., MEDVEDEV, Yu.A., PUNKEVICH, B.S., and STEPANOV, B.M., All-Union Scientific Research Institute of Optico-Physical Measurements

"Magnetic Field Probing of the Detonation Region of a Charge of Explosives"

Moscow, Doklady Akademii Nauk SSSR, Vol 197, No 1, Mar 71, pp 70-72

Abstract: On the basis of previous research, it has been found that the distortion in a constant extrinsic field is lower than the sensitivity of the magnetic field sensors used. In order to increase the field perturbation created by an explosion up to easily observable values it is necessary to either increase the initial field or the magnitude of the explosion or to conduct the explosion in a variable field that varies at the frequency for which the thickness of the skin-layer is on the order of magnitude of the detonation region. It is simplest to create the detonation in a variable magnetic field. This article describes the appropriate experiments in this direction and the results obtained therefrom.

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Figure 1 in this article shows a typical oscillogram of the process and Figure 2 gives the signal of un-

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VEL'MIN, V.A., et al, Doklady Akademii Nauk SSSR, Vol 197, No 1, Mar 71, pp 70-72

balance as a function of time, averaged over about 100 tests, in relative units. The conclusion is reached that at least in the initial moments of time the conductivity is concentrated in the layer where, for small values of t, the effective thickness of the conducting layer is much less than the difference in radii of the front of the shock wave and the leading edge of the explosion products and that it grows with time.

The obtained results may be explained by the decrease in the temperature gradient with the passage of time and consequently by the increase in the characteristic length by which the degree of thermal ionization of air drops near the contact surface of the explosion products. Additional data are needed on the magnitude of $\Delta(t)$ at these moments in order to determine the absolute values of the time-averaged conductivity.

The article contains 2 figures and a bibliography of 5 titles.

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Electromagnetic Wave Propagation

USSR

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VEL'MIN, V. A., MEDVEDEV, Yu. A., STEPANOV, B. M., Moscow

"Transmission of Radio Waves Through the Area of an Explosion"

Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 410-413

Abstract: Results are presented from an experimental study of the peculiarities of transmission of radio waves in the centimeter wave length range through the unstable area of an explosion. When explosions were set off on the transmission path of a 3.2 cm radio wave, two transmission minima were observed, with a maximum between the two minima at a level higher than the zero line (level of transmission without explosion). The first minimum is apparently related to coverage of the direct radio waves by a strong shock wave sufficient to create strong ionization and consequently high conductivity on the wave front, causing the wave front to be nontransparent. Experiments involving replacement of this proposed conducting area with a conducting metal plate indicated satisfactory correspondence

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VEL'MIN, V. A., MEDVEDEV, Yu. A., STEPANOV, B. M., Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 410-413

between theory and experimental results. A possible future application might be estimation of parameters of explosions by transmission of radio waves through explosion zones.

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USSR

UDC: 621.373:530.145.6

VEL'MUSHKIN, L. A., SKVORTSOV, B. V., ROLDUGIN, V. I.

"A Pulse Gas-Discharge Pumping Tube for Optical Masers"

USSR Author's Certificate No 275259, filed 12 Oct 68, published 26 Oct 70 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D241 P)

Translation: A pulse gas-discharge laser pumping tube is proposed which contains a discharge flask made in the form of a T-shaped tube, a metal busbar which is electrically connected to one of the two electrode assemblies and located on the surface of the flask in such a way that the longitudinal axis of the cylindrical branch of the flask is perpendicular to the above-mentioned busbar. In order to improve the efficiency of ring emission in the ultraviolet spectral region, eliminate the additional heating of the active medium of the laser by infrared radiation from the discharge channel, and also to increase the maximum energy of a flash, the cylindrical branch of the flask accommodates a cylindrical chamber of smaller diameter coaxial with the branch, closed on the side of the axis which joins the electrodes, and used for holding the active medium of the laser. To facilitate breakdown of the discharge gap and to reduce the

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VEL'MUSHKIN, L. A. et al., USSR Author's Certificate No 275259

a radial shock wave on the end of the cylindrical chamber, the closed end of this chamber has a conical construction which comes out on a level no higher than the axis of symmetry of the electrode assemblies of the tube.

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UDC 616-001.34-06:616.282.1

NEKHOROSHEVA, M. A., and VEL'SKAYA, M. L., Institute of Labor Hygiene and Occupational Diseases, Donetsk

"Cochleovestibular Damage Resulting From Vibration Sickness"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 7, 1973, pp 9-11

Abstract: Hearing and vestibular analysor function were studied among 80 miners experiencing 95-137 db noise and local 17-40 Hz vibration and suffering stage I vibration disease coupled with peripheral angiovegetodystonia (35, group 1), stage I vibration disease coupled with sensory polyneuritis (30, group 2), or peripheral angiovegetodystonia (25, group 3). While group 3 patients had normal hearing, groups 1 and 2 had varying degrees of cochlear neuritis. Speech discrimination was 100% for 28.6, 65, and 80% of individuals by 40-45 db in groups 1, 2, and 3 respectively. While all of group 3 and 18 of group 2 demonstrated 100% speech discrimination at 120 db, 13.1% of group 1 were not able to attain this level. Dissociation in data on tonal versus speech audiometry suggests that damage is experienced more by the cortical than the peripheral sections of the acoustic analysor. Responses to thermal and rotary tests indicated that effects on the vestibular analysor were variable.

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USSR UDC 536.25

VEL'TISHCHEV, N. F., ZHELNIN, A. A.

"Cellular Convection in a Vorticity Field"

Tr. Gidrometeorol. n.-i. tsentr. SSSR (Works of the Hydrometeorological Scientific Research Center of the USSR), 1971, No. 73, pp 3-16 (from RZh-Mekhanika, No 9, Sep 71, Abstract No 9B686)

Translation: The nonlinear problem of cellular convection in an atmosphere rotating with constant angular velocity is discussed. It is shown that the rotation has a "stretching" effect on convective motion in the atmosphere. The critical values of the absolute vortex under which the existence of hexagonal convective cells or two-dimensional rolls becomes impossible are a function of the nonlinearity of the temperature profile, viscosity and the scale of the perturbations arising. An increase in the nonlinearity of the temperature profile and the coefficient of temperature viscosity and a drop in the wavelength leads to an increase in the critical value of the absolute vortex under which regular convection in the form of hexagonal cells and two-dimensional rolls becomes impossible. Quasihexagonal cells may exist for a magnitude of the absolute

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VEL'TISHCHEV, N. F., ZHELNIN, A. A., Tr. Gidrometeorol. n.-i. tsentr. SSSR, 1971, No. 73, pp 3-16

vortex of the order of 10^{-4} - 10^{-5} sec^{-1}. Convective cells with a diameter equal to 100 km become unstable even for an absolute vortex of the order of $8 \cdot 10^{-6}$ sec^{-1}. This explains the reason for the absence of quasihexagonal cells of diameter more than 100 km in television pictures from satellites. Authors abstract.

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1/2 031 UNCLASSIFIED PROCESSING DATE--30OCT70

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMAL DEGRADATION IN AIR OF AROMATIC POLYAMIDES WAS STUDIED. THE AMTS. OF THE POLYMERS CONVERTED TO GASES IN 30 MIN AT THE DECOMPN. TEMPS., THE ACTIVATION ENERGIES OF THE DEGRADATION AT 410-20DEGREES AND 440-60DEGREES, THE TEMPS. AT WHICH 20PERCENT OF THE GEL FRACTION REMAINS, AND THE TEMPS. AT WHICH THE VISCOSITY IS REDUCED TO 0.5 OF ITS ORIGINAL VALUE IN 30 MIN ARE GIVEN. HETERO GROUPS IN THE POLYMER MOLS. LOWER THE THERMAL OXIDATIVE RESISTANCE IN THE ORDER CH SUB2 LARGER THAN S LARGER THAN CO LARGER THAN O LARGER THAN SO SUB2 LARGER THAN OR EQUAL TO CF SUB2 CF SUB2.

FACILITY: VLADIMIR. NAUCH.-ISSLED. INST. SIN. SMOL, VLADIMIR, USSR.

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VELYCHKO, I. M., and MYGAL', O. K., Institute of Hydrobiology, Academy of Sciences Ukrainian SSR, Kiev

"Method for Determination of the Average Volume of Algae Cells"

Kiev, Ukrainskiy Botanicheskiy Zhurnal, Vol 28, No 2, Mar/Apr 71, pp 251-253

Abstract: Direct determination of the biomass of algae is possible only when algae occur in great numbers (e.g., in "blooming" reservoirs) and the water does not contain a large number of particles other than algae cells. If these conditions are not fulfilled, the volume method of estimating the biomass is applied, which is based on a determination of the average cell volume. The average volume of algae cells that belong to different dimensional groups, but constitute geometrically similar bodies can be calculated more precisely by using the mean cubical rather than mean arithmetic linear parameters of a cell. The mean cubic linear parameters are calculated according to the formula

$$K = \sqrt[3]{\frac{\Sigma x^3}{n}},$$

where x are the results of individual measurements and n is the number of cells measured.

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VELYEYEV, U.S.

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(4)

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23 April 1973

EXTERNAL ELECTRIC FIELD RECORDED AROUND ANIMALS, MAN

[Article by U. S. Velyeyev, O. S. Osyenniy, Yu. V. Tornuyev, D. F. Rakytyans'kyy; Institute of Physiology, Siberian Branch of the USSR Academy of Sciences, Novosibirsk; Kiev, Fiziolohichnyy Zhurnal Akademiyi Nauk Ukrayins'koyi RSR, Ukrainian, Vol 19, No 1, 1973, pp 99-104]

The attention of many researchers has been attracted recently by electromagnetic fields that originate in and around excited systems. Information regarding the presence of an electric field around an excited isolated nerve appeared first in 1949 /5/. The existence of a magnetic field around a nerve /6/ and of electric and magnetic fields around the heart became known later /2, 4/. Experimental results regarding the electric field around man and animals /1/ showed that characteristics of the recorded electric field around the human heart at a distance of 1 m cannot be explained within the framework of our understanding of the heart as an electric field generator.

The aim of this work was to study the characteristics of the electric field which can be recorded around biological subjects and to explain its nature.

Methods

The method of recording the external electric field of biological subjects was developed on the assumption that the source of this field is the hypothetical electric dipole located in the volumetric conductor and which produces a difference in potentials that is equal to the QRS wave amplitude on an electrocardiogram.

In order to record the electric field of biological subjects, it is necessary to have very sensitive apparatus (10^{-3} to 10^{-4} v). In our experiments we used the electrometric amplifier UI-2 with the input base of $R_{input} = 10^{11}$ ohm which was necessary to satisfy the field source impedance and the recording device. The maximal sensitivity of the

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device between 0.5 Hz and 1 kHz was 10^{-3} V. In several instances,
standard band filters were used at the input of the indicating device.

A comparatively high external interference produced by the
earth's electric field, other functioning equipment, and the feed net-
work required very strict screening of the subject under study. The
screening chamber was in the shape of a cube, with 3-meter sides. De-
signing a chamber that considerably exceeded the size of the subject
under study was very important, because only in this case would it be
possible to observe alternations in the recorded external electric field
which originate due to the volumetric asymmetry of the subject with re-
spect to the walls of the screening chamber. For the same reason, all
subjects were placed approximately in the center of the chamber in a
horizontal position.

Three remote electrometer units of three amplifiers were sus-
pended with special stretchers /roztyazhka/ from the chamber ceiling at
different distances from the heart of the subject investigated. This
made it possible to record the electric field at three points simulta-
neously. In addition, it was made possible to record the EKG synchro-
nously with the recording of the electric field. All measuring devices
were placed outside the chamber, with the exception of the remote units
of the amplifiers and the electric field sensors. Leads for the contact
EKG were shielded and the shields were grounded.

Metal discs 25 mm in diameter served as field sensors, and they
were attached to input terminals /shtyr'/ of the electrometer units.
Each disc was surrounded by a protective ring which was connected
through a resistance with the case of the remote unit. The time con-
stant of this ring was equal to the time constant of the input of the
electrometer with the electric field sensor. The disc side facing the
subject was considered to be the working surface.

The humidity of the surrounding air was recorded simultaneously
with the electric field.

The amplifying line was calibrated by placing the field sensor
between two plane-parallel plates to which was applied the calibrating
pulse, the shape of which resembled that of the field signal.

Frogs, cats, and people were the subjects of study. The electric
field was recorded when the subject was grounded, and when there was no
contact between the subject and the surrounding leads or the ground. In
the second case the EKG was not taken. Figure 1 shows a schematic dia-
gram of the recording unit.